Notice of Allowability	Application No. 10/613,019	Applicant(s) DOWLING, ERIC MORGAN
	Examiner Lawrence B. Williams	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *amendments filed on 10 November 2006*.

2. ☒ The allowed claim(s) is/are *1-21*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some*   c) ☐ None of the:

       1. ☐ Certified copies of the priority documents have been received.

       2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

       3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

        1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____ .

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

    Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)

3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application

6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .

7. ☐ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____ .

REASONS FOR ALLOWANCE

1.   The following is an examiner's statement of reasons for allowance: The instant

application discloses a subscriber modem apparatus. The closest prior art of record is applicant's

US Patent 6,597,732. A search of prior art records has failed to teach or suggest alone or in

combination:

" a subscriber modem apparatus that couples to an analog subscriber line and is operative

to cooperate with a cooperative modem located across a digital network, the digital network

being coupled to the subscriber line via a network line interface card, the subscriber modem

comprising: a remote-echo canceller coupled to receive a downlink training signal sent by the

cooperative modem and to process the training signal in order to allow at least one parameter to

be adjusted in the remote-echo-canceller, the remote-echo canceller operative to apply the at

least one parameter to a downlink signal to produce a digital representation of a remote-echo

cancellation signal, wherein the remote-echo cancellation signal is computed such that when it

passes through the subscriber line and then combines with an echo signal at the input to an ADC

(analog to digital converter) located within the network line interface card, a remote echo-

cancellation error signal is produced at the input to the ADC in which at least some components

of the echo signal have been substantially reduced, and wherein the computation of the

parameter involves a first set of computations computed at the cooperative modem and a second

set of computations computed in the subscriber modem; a modem transmitter module which

converts a bit stream into a digital representation of a modulated uplink signal; and a combining

unit which combines the digital representation of the modulated uplink signal with the digital

representation of the remote-echo cancellation signal and couples the combined signal to a DAC

(digital to analog converter) for subsequent coupling as an uplink analog signal onto the

subscriber line to be transmitted to the ADC; whereby the ADC samples a signal comprising a

superposition of the modulated uplink signal, the echo signal and the remote echo cancellation

signal; whereby the superposition of the echo signal and the remote echo cancellation combine to

produce a remote echo cancellation error signal, a measure of which is

reduced with respect to the echo signal" as disclosed in claim 1.

" a subscriber modem apparatus that couples to an analog subscriber line

and is operative to cooperate with a cooperative modem located across a digital network,

the digital network being coupled to the Subscriber line via a network line interface card,

the subscriber modem comprising: a coupling to receive from the subscriber line a downlink

training signal sent from the cooperative modem; a digital signal processor operative to execute

software functions in order to process a set of signals; a first software function operative to

convert the downlink training signal into a set of downlink channel parameters which serve to

parametrically model a downlink transfer function of a communication path extending from the

line interface card to the subscriber modem via the subscriber line; a second software function

that causes an uplink training signal to be coupled via the subscriber line to the cooperative

modem to allow the cooperative modem to model an uplink transfer function; a set of remote

echo canceller parameters that are jointly derived using the downlink parameters derived in the

subscriber modem and the uplink parameters derived in the cooperative modem; a third software

function for use during a normal data-mode operation, wherein the third software function causes

the remote echo canceller to receive a downlink data signal, apply it to a digital filter, and

generate a remote echo cancellation signal; a combiner function to combine the remote echo

cancellation signal with an uplink modem signal; wherein when the combination of the remote

echo cancellation signal and the uplink modem signal traverse the uplink subscriber line transfer

path and reach an ADC (analog to digital converter) located in the line interface card, whereby at

least a substantial component of a downlink-to-uplink echo as seen at the input to the ADC in the

line interface card is substantially reduced" as disclosed in claim 9.

" in a communication system involving a digital modem coupled to a digital network, a

line interface card that couples the digital network to a subscriber line, and a subscriber modem

coupled to the subscriber line, a method of cooperative training used to converge upon a set of

parameters for use within a remote echo canceller located in the subscriber modem, wherein the

set of parameters are iterated to substantially reduce a measure of an echo cancellation error

signal as observed at an ADC (analog to digital converter) located within an uplink path of the

line interface card, a method comprising: at the digital modem, transmitting a training signal in a

downlink direction to the subscriber modem wherein the training signal passes through the line

interface card; at the subscriber modem, receiving the training signal from the subscriber line,

digitizing the training signal, and applying the digitized training signal to a remote echo

canceller, wherein the remote echo canceller uses a present set of parameters in a parametric

model to generate a remote echo cancellation signal, and coupling the remote echo cancellation

signal via the subscriber line to the line interface card; at the digital modem, receiving a set of

values that correspond to a remote-echo-cancellation-error signal as digitized by the ADC within

the line card and transmitted back to the digital modem via the digital network, wherein the

remote-echo-cancellation-error signal is developed as a superposition of the downlink training

signal and the uplink remote echo cancellation signal; at the digital modem, computing a

parameter adjustment to produce a modified set of parameters to be used in the remote echo canceller, wherein the parameter adjustment is estimated to reduce a measure of the remote-echo-cancellation-error signal, and transmitting an indication of the parameter adjustment to the subscriber modem; in the subscriber modem, adjusting the set of parameters used in the remote echo canceller and readying itself to receive a subsequent training signal for a next iteration of adjustment" as disclosed in claim 17.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

CONCLUSION

2.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence B Williams whose telephone number is 571-272-3037. The examiner can normally be reached on Monday-Friday (8:00-6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ghayour Mohammad can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lawrence B. Williams
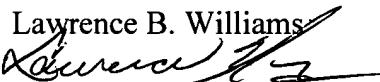
lbw

November 29, 2006
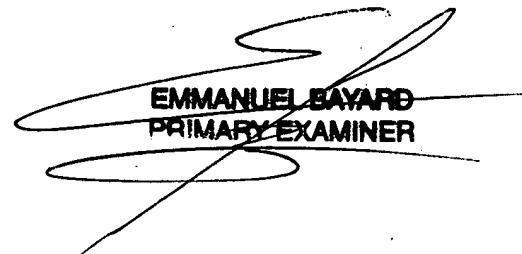
EMMANUEL BAYARD
PRIMARY EXAMINER